

Figure 1: Block Diagram of Typical Apparatus for Evaluating Ultrasound Scanner

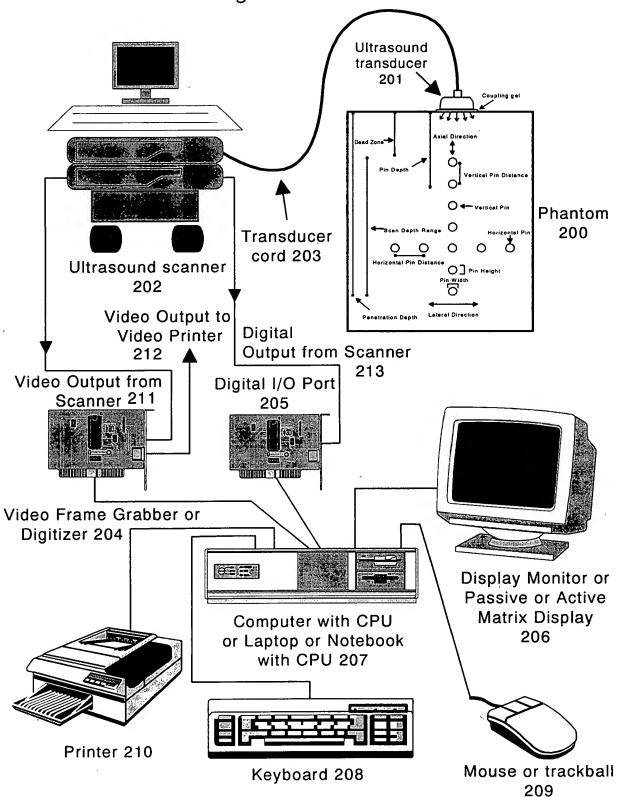


Figure 2. Processing of "Phantom Image"

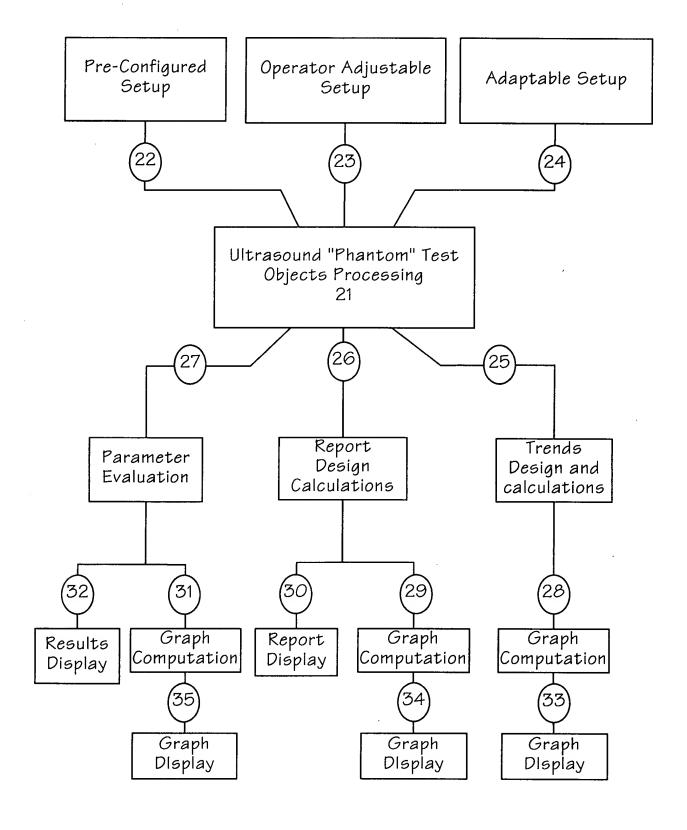


Figure 3. Parameter Evaluation Procedure

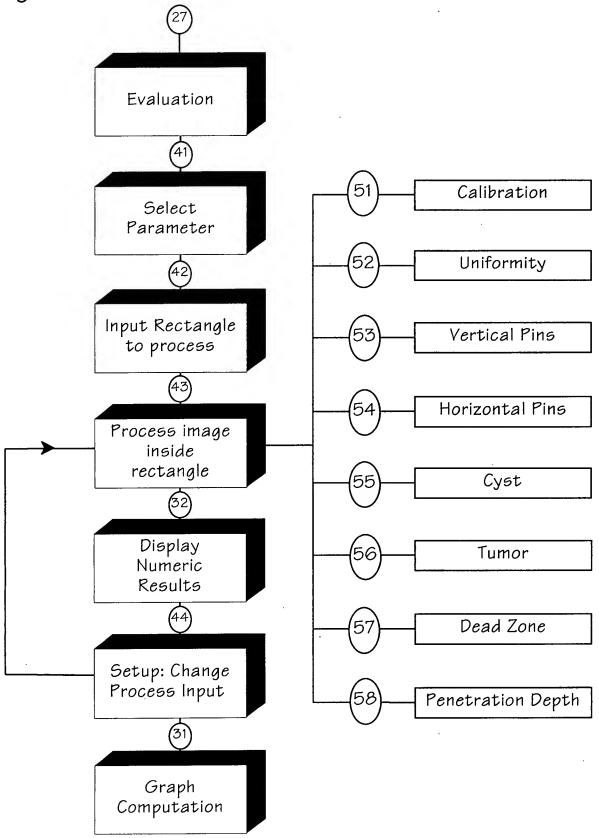


Figure 4. General Schematic-Inputs

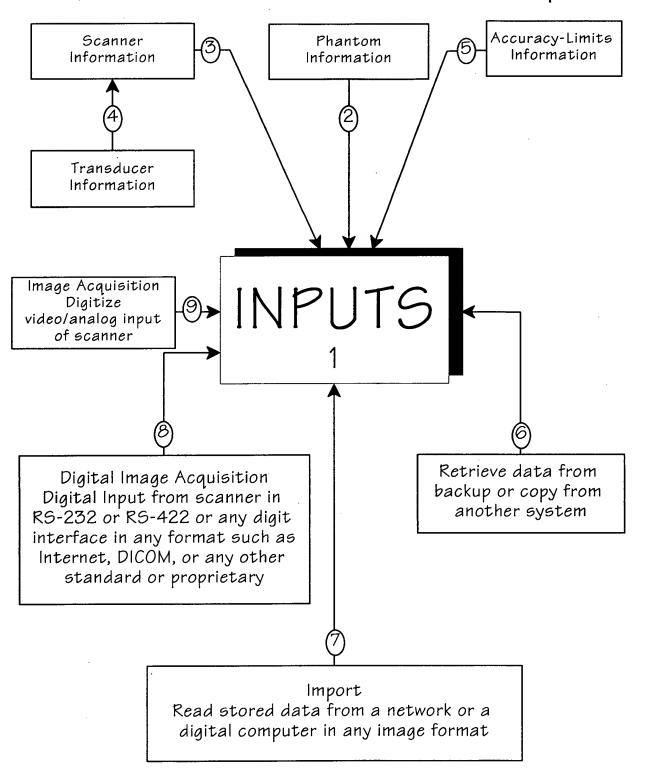


Figure 5. Phantom Test Objects

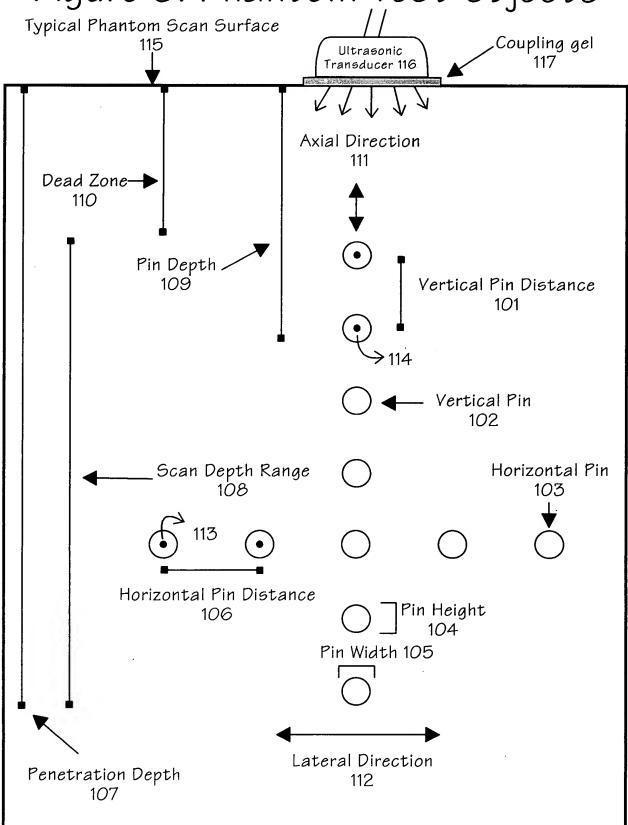


Figure 6. General Schematic-Outputs

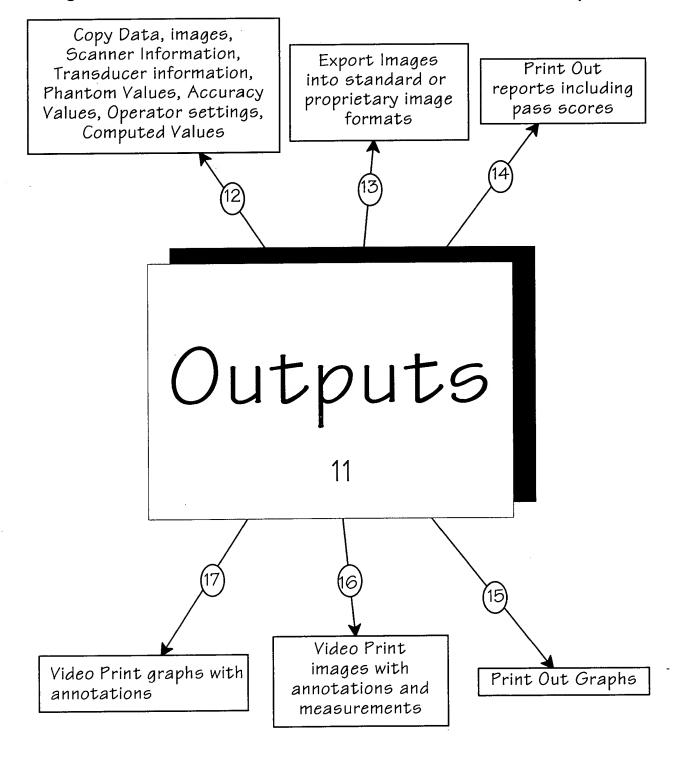


Figure 7: Display Example

In Operation

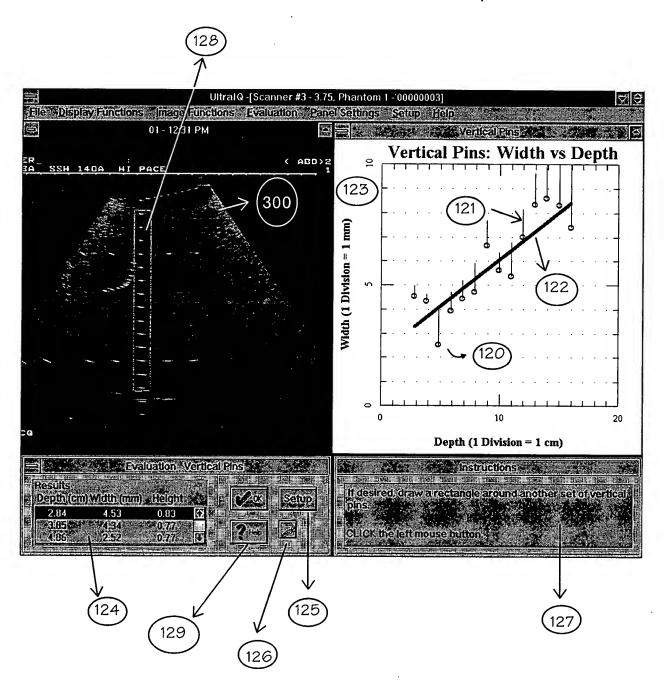
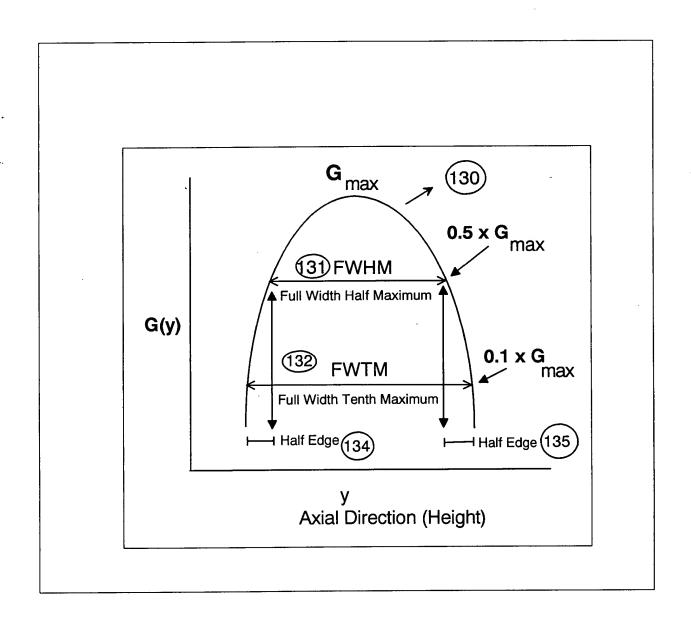
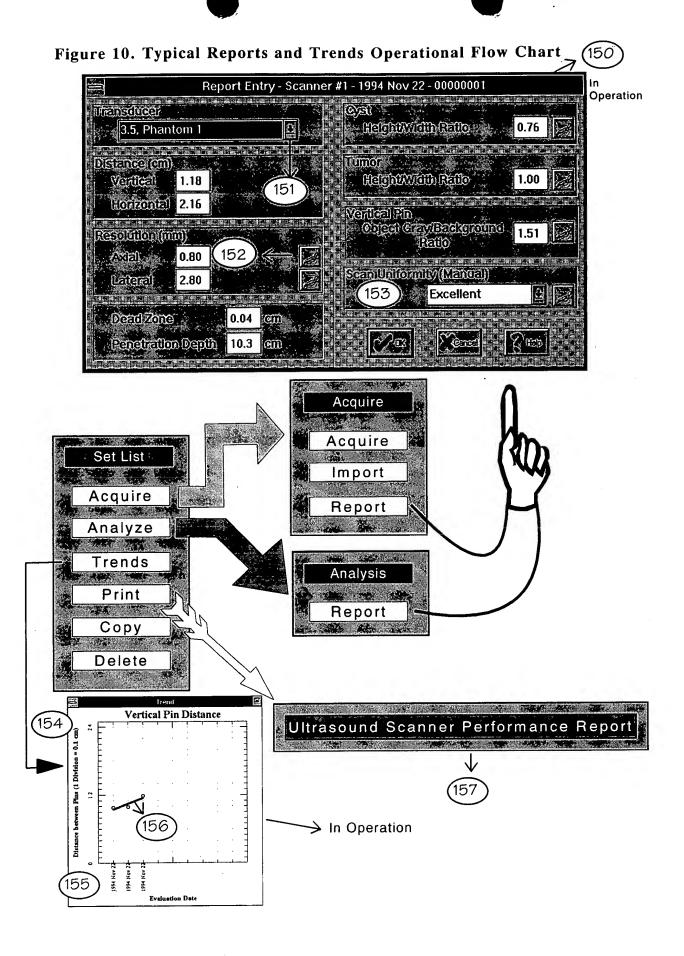


Figure 8. Example of Object Profile Pin Object Gray Level Profile in Axial Direction

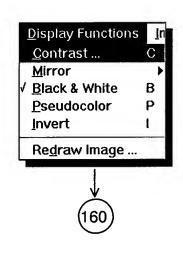


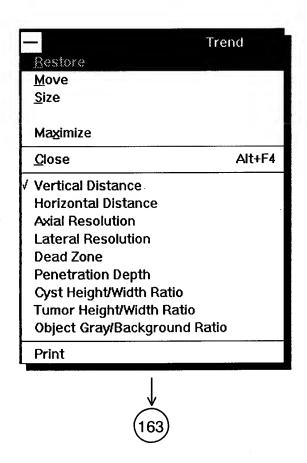
> (140) Evaluation In Operation Calibration Uniformity Vertical Pins Evaluation - Vertical Pins Horizontal Pins Cyst **Tumor** Setup Dead Zone Penetration Depth In Operation **Object Settings** In Operation Vertical Pins In Operation Vertical Pins: Height vs Depth Restore Move Size Height (1 Division = 0.5 mm) Minimize Maximize Close Alt+F4 Width vs Depth Height vs Depth Area vs Depth Pin Distance vs Depth Object Gray/Background Ratio Mean Gray vs Depth Sigma Ratio vs Depth 20 Print Depth (1 Division = 1 cm) Help

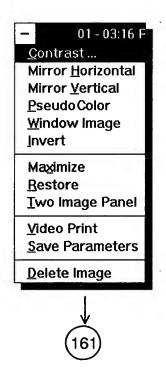
Figure 9. Typical Evaluation Operational Flow Chart

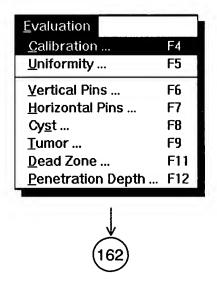












Scanner/Transducer List			
Scanner	Location	Transdycer	
Scanner #1	Missisauga	3.5, Phantom 1	
Scanner#1	Missisauga	5.0 Phantom 1	
Scanner#1	Missisauga Etobicøke	7:5; Phantom 1 3:5; Phantom 1	
Scanner#2 Scanner#3	Markham	3.75. Phantom 1	
Scanner #3	Markham	7.5, Phantom 1	
Scanner #4	Hamilton	2.5. Phantom 2	
Scanner#4	Hamilton	9.75, Phantom 2 3.5, Phantom 2	
Scanner#5	Toronto	- 59, Enantoniz _{ii}	
	Set List New	Set 2 Heb 222002 2000	
Phantom !!!	Limits Up	date Delete	

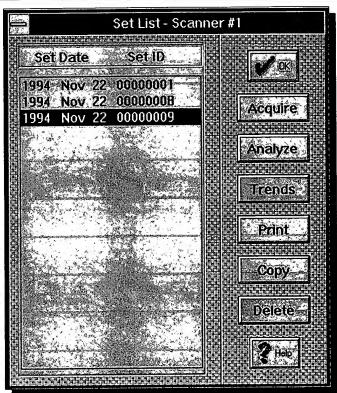


Figure 13. Typical Dialog for Accessing Tasks - Operation

Figure 14. Typical Performance Parameters Entry Dialog In Operation

F	Phantom Values - Scani	ner #1, 3.5, Phantom 1	56606666	
Distance (cm) Vertical 1 Horizontal 1	Resolution (min) Axial .5 Lateral .8	Dead Zone Penetration Depti		cm em
Copy From Scanner #1	, 3.5, Phantom 1			
	OC Care	?		

stance		and the second s	Resolution			
Vertical ±	10	♦ mm & %	Axial	+ 20	© mm ⊕%	l Fere
Horizontal ±	15	⊕mm&%_	Lateral.	+ 20	© mm ⊗%	
Dead Zone	+ 3		Penetration	Depth	5 ♦ mm	K Can
opy From		, Phantom 1		Military PLE CAPAC		?

Figure 15. Typical Performance Parameter Limits Entry Dialog - In Operation

Produced by Measurements by	VIJAY RAMANATHAN VIJAY RAMANATHAN			Date: 1995 Feb 20 Date: 1994 Nov 22		
Scanner Name:	Scanner #3	Serial #	53			
Manufacturer:	Company C	Model #	A3			
Location:	Toronto					
Transducer Name:	3.75, Phantom 1	Scrial #	TRAN53.75			
Distance Accuracy:	Vertical Spacing	1. <i>0</i> 1 cm	Horizontal Spacing	2.12	cm	•
Spatial Resolution:	Axial	0.83 mm	Lateral	2.07	mm	
Scan Depth:	Dead Zone	0.73 cm	Penetration Depth	16.5	cm	
ObjectParameters:	Pin Object Mean Gray to Background Gray Ratio			2.27		
	Cyst Object Mean Height/Width Ratio			0.93		
	Tumor Object Mean	Heiaht/Width Ra	tio	0.75		
Scan Quality:	Uniformity/Artifacts			Excellent		
Transducer Name:	7.5. Phantom 1	Serial #	TRANS7.5			
Distance Accuracy:	Vertical Spacing	0.99 cm	Horizontal Spacing			
Spatial Resolution:	Axial	0.72 mm	Lateral	1.81	mm	
Scan Depth:	Dead Zone	0.57 cm	Penetration Depth	7.6	cm	
ObjectParameters:	Pin Object Mean Gray to Background Gray Ratio			18.90		

^{* -} value to the left is outside acceptable range